

AUDIT  
REPORT

WASTE INVENTORY DATA  
AT OAK RIDGE  
AND SAVANNAH RIVER



DECEMBER 1998

U.S. DEPARTMENT OF ENERGY  
OFFICE OF INSPECTOR GENERAL  
OFFICE OF AUDIT SERVICES

December 18, 1998

MEMORANDUM FOR THE SECRETARY

FROM: Gregory H. Friedman  
Inspector General

SUBJECT: INFORMATION: Audit Report on "Waste Inventory Data at Oak Ridge and Savannah River"

BACKGROUND

The Oak Ridge and Savannah River Operations Offices are responsible for maintaining reliable and accurate waste inventories to ensure effective waste management operations at their sites. As of April 1998, the Oak Ridge Reservation stored about 105,000 containers of hazardous, low-level, and low-level mixed waste, with a volume of 72,500 cubic meters. As of May 1998, the Savannah River Site stored about 13,500 containers of hazardous, low-level, and low-level mixed waste, with a volume of 14,500 cubic meters. The objective of this audit was to determine whether the hazardous, low-level, and low-level mixed waste inventories at the Oak Ridge Reservation and the Savannah River Site were accurate and reliable in Fiscal Year (FY) 1998.

RESULTS OF AUDIT

The volume of hazardous, low-level, and low-level mixed waste stored at the Oak Ridge Reservation was overstated in FY 1998 inventory records, and the locations of many waste containers at the Savannah River Site were recorded inaccurately or incompletely. As a result, the Department could not rely on the waste inventory data at the Oak Ridge Reservation to make informed decisions regarding the amount of waste to be treated or disposed. Additionally, the Department incurred unnecessary costs adjusting waste inventory data for management reports at the Oak Ridge Reservation and locating waste containers for treatment or disposal at the Savannah River Site.

We recommended that the Acting Assistant Secretary for Environmental Management establish general requirements for tracking and reporting waste inventories at the sites. We also recommended that the Manager, Oak Ridge Operations Office direct contractor personnel to perform an inventory of stored waste and establish adequate procedures to ensure that waste inventory records are kept current, accurate, and complete at all Oak Ridge Reservation sites. Further, we recommended that the Manager, Savannah River Operations Office ensure that the planned inventory of stored waste is completed, and that contractor personnel record the storage location for all containers and update inventory data when containers are moved.

MANAGEMENT REACTION

Management concurred with the audit recommendations and planned to take appropriate actions. However, the Oak Ridge Operations Office did not agree that programmatic or project decisions were affected by the errors discovered during the audit.

Due to the large amount of mixed and low-level waste stored at the Oak Ridge Reservation, we believe that Departmental waste treatment and disposal decisions could be adversely impacted by waste inventory errors discovered during the audit. The Department's *FY 1999 Environmental Management Budget Request* showed that as of September 30, 1997, the Oak Ridge Reservation stored 67 percent of the Department's mixed waste and 42 percent of the low-level waste.

Attachment

cc: Acting Deputy Secretary  
Under Secretary

# WASTE INVENTORY DATA AT OAK RIDGE AND SAVANNAH RIVER

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## Overview

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### INTRODUCTION AND OBJECTIVE

The Department made a commitment in its FY 1998 Performance Agreement with the President to reduce the life-cycle costs of cleanup and dispose of waste generated during past and current activities. To meet the commitment, reliable waste inventory data is needed so that the Department can accurately account for waste from generation to disposal.

The Oak Ridge and Savannah River Operations Offices are responsible for maintaining reliable and accurate waste inventories to ensure effective waste management operations at their sites. As of April 1998, each of the three Oak Ridge Reservation sites [East Tennessee Technology Park (ETTP), Y-12 Plant (Y-12), and Oak Ridge National Laboratory (ORNL)] operated a unique waste inventory system. The systems were used to track about 105,000 containers of hazardous, low-level,<sup>1</sup> and low-level mixed waste,<sup>2</sup> with a volume of 72,500 cubic meters. As of May 1998, the Savannah River Site tracked about 13,500 containers of hazardous, low-level, and mixed waste, with a volume of 14,500 cubic meters.

In April 1990, the Office of Inspector General issued Report DOE/IG-0284, *Management Information Systems for Environmental Compliance Activities*. The audit concluded that the Department did not have a comprehensive database of information for management's use in demonstrating environmental compliance. Instead, the Department and its contractors developed and maintained many different information systems to track and report environmental compliance activities. As a result, the Department could not effectively oversee field office and contractor activities nor provide reasonable assurance to the President, the Congress and the public that environmental concerns were promptly identified and addressed.

The objective of this audit was to determine whether the hazardous, low-level, and mixed waste inventories at the Oak Ridge Reservation (Oak Ridge) and the Savannah River Site (Savannah River) were accurate and reliable in FY 1998.

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<sup>1</sup> Low-level waste has a wide range of characteristics, but most of it contains small amounts of radioactivity in large volumes of material.

<sup>2</sup> Low-level mixed waste is low-level radioactive waste that also contains hazardous components. Throughout this report, low-level mixed waste will be referred to as mixed waste.

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**CONCLUSIONS AND  
OBSERVATIONS**

The volume of hazardous, low-level, and mixed waste stored at Oak Ridge was overstated in FY 1998 inventory records, and the locations of many waste containers at Savannah River were recorded inaccurately or incompletely. These conditions occurred because the Department had not established minimum requirements for tracking waste at the sites, the Oak Ridge Operations Office had not established adequate tracking procedures, and the Savannah River Operations Office did not adhere to its established procedures. As a result, the Department could not rely on the waste inventory data at Oak Ridge to make informed decisions regarding the amount of waste to be treated or disposed. Additionally, the Department incurred unnecessary costs adjusting waste inventory data for management reports and locating waste containers for treatment or disposal.

The audit identified issues that management should consider when preparing its yearend assurance memorandum on internal controls.

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Office of Inspector General

## WASTE VOLUME AND LOCATION

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### **Waste Volumes Were Overstated**

The volume of hazardous, low-level, and mixed waste stored at Oak Ridge was overstated in FY 1998 inventory records. We tested the accuracy of the volumes of waste shown in inventory records for 565 containers (337 in Oak Ridge and 228 in Savannah River) and determined that the volumes were overstated for 34 containers. The discrepancies identified for nine containers at Y-12 and two containers at Savannah River were minimal. However, the discrepancies identified for 23 containers at ETTP were significant. Specifically, we determined that 23 of 114 containers (20 percent) selected for testing at ETTP did not exist at the time of our inventory.

Oak Ridge Operations Office and contractor personnel acknowledged that the volume of waste shown in the inventory records was overstated. ETTP waste management personnel stated that the inventory was routinely adjusted for empty containers, duplicate barcode numbers, and waste which had been incinerated, before reports were generated for management's use.

We examined ETTP's March 1998 and June 1998 inventory reports to determine if all required adjustments had been made and the waste volumes were accurate with respect to the discrepancies identified during the audit. The March 1998 report was generated before we performed the audit test and the June 1998 report was generated after we discussed the test results with ETTP management. We determined that the June 1998 report was adjusted to correct the discrepancies identified during the audit. However, the March 1998 report was overstated by about 4,000 cubic meters, or 13 percent.

The Oak Ridge management and integration contractor was in the process of awarding a subcontract to develop a uniform system at all three sites to control waste tracking operations. The contractor plans to have a new set of integrated procedures in place by February 1999 and the capability to perform 100-percent inventories using barcode technology by August 1999. The contractor's actions should improve the accuracy of inventory data and could significantly reduce errors in future waste tracking data.

### **Container Locations Were Inaccurate or Incomplete**

In addition to overstatements in the waste volumes, container locations were inaccurately or incompletely recorded for 126 of 565 containers tested. We could not verify the location or size of 110 of 113 low-level waste containers selected for testing at Savannah River because they were densely packed into waste vaults or storage boxes and were not

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readily accessible. At Oak Ridge, we found five containers in locations other than shown in the inventory records. At Savannah River, we found 47 containers in locations other than shown, 46 containers without any location recorded, and 28 containers with incomplete storage locations recorded in the system.

Savannah River Operations Office began work on a new hazardous and mixed waste tracking system in early FY 1998. The new waste tracking system is scheduled to be operational in the second quarter of FY 1999. To ensure that data in the new tracking system is accurate, hazardous and mixed waste will be inventoried and locations recorded using barcode technology. Implementation of the new system could significantly reduce errors in future waste tracking data.

**The Department Needs Accurate Data to Evaluate Performance and Project Future Requirements**

One of the foundations of the Department's environmental management program is strong financial and managerial control, including the maintenance of comprehensive and accurate waste inventories. The Office for Environmental Management uses the inventory data to evaluate progress towards meeting the Department's performance goals and to forecast budget requirements. Without accurate information on the amount of waste in storage and awaiting treatment or disposal, the Department may not be able to accurately track its progress toward meeting the commitment established in the FY 1998 Performance Agreement. Additionally, management decisions for cleanup of contaminated sites could be adversely impacted by inaccurate waste inventory data.

**Department Did Not Establish Minimum Requirements**

Inventory data were inconsistent among the sites because the Department did not establish minimum requirements for tracking and reporting waste inventories throughout the complex. In the absence of Departmentwide guidance, each site developed unique tracking and reporting processes. At ETTP, the inventory data included detailed information which identified the building, row, and location within the row where each container was located. By comparison, the inventory data at ORNL identified only the building or storage pad where the container was located. At Savannah River, the inventory data varied according to the type of waste involved. For example, the data identified the building and bay or row for hazardous and mixed waste containers, but only the waste vault or storage box where the container was located for low-level waste containers.

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**Oak Ridge Had Not Established Adequate Waste Tracking Procedures**

At Oak Ridge, procedures were not established to delete waste from the inventory after it was sent to an on-site treatment facility and incinerated. Additionally, management had to establish a process for reviewing and adjusting Oak Ridge inventory data prior to generating waste volume reports. However, this review and adjustment process had not identified or corrected all errors that impacted stored waste volumes.

**Savannah River Did Not Follow Procedures**

At Savannah River, adequate procedures had been developed; however, waste management personnel did not consistently adhere to the procedures. For example, site procedures required that waste be tracked to a building and bay or row, but personnel often moved the containers without updating waste inventory locations. Also, Savannah River personnel did not record storage locations for most hazardous waste containers contaminated with chemicals, metals, and pesticides.

**Department Could Not Rely on Waste Inventory Data and Incurred Unnecessary Costs**

As a result of the problems identified at Oak Ridge, the Department could not rely on waste inventory data to make informed decisions regarding the amount of waste to be treated or disposed of. Also, the Department incurred unnecessary costs adjusting waste inventory data for management reports at Oak Ridge and locating containers of waste for treatment or disposal at Savannah River. However, we could not quantify the amount of time spent or the unnecessary costs incurred because Oak Ridge personnel did not keep track of the amount of time spent adjusting waste inventory data and Savannah River personnel did not keep track of time spent searching for waste containers.

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## RECOMMENDATIONS

We recommend that:

1. The Acting Assistant Secretary for Environmental Management establish general requirements for tracking and reporting waste inventories at the sites, including the type and amount of information required;
2. The Manager, Oak Ridge Operations Office direct contractor personnel to perform an inventory of stored waste and establish adequate procedures to ensure that waste inventory records are kept current, accurate, and complete at all Oak Ridge sites; and
3. The Manager, Savannah River Operations Office ensure that the planned inventory of stored waste is completed, and that contractor personnel record the storage location for all containers and update inventory data when containers are moved.

## MANAGEMENT REACTION

The Office of Environmental Management and the Oak Ridge and Savannah River Operations Offices concurred with the finding and recommendations, and planned to take appropriate corrective actions. However, the Oak Ridge Operations Office did not agree that programmatic or project decisions were affected by the errors discovered during the audit. Also, the Oak Ridge Operations Office stated that the March 1998 report represented only one-quarter of the year and was not indicative of pervasive errors, or errors spanning the entire year.

## AUDITOR COMMENTS

We consider management's reaction to be responsive to the audit recommendations. However, we disagree with the Oak Ridge Operations Office that the waste volume errors identified at Oak Ridge would not impact programmatic or project decisions. Due to the large amount of mixed and low-level waste stored at Oak Ridge, we believe that Departmental waste treatment and disposal decisions could be adversely impacted by waste inventory errors found at the site. Specifically, data in the Department's *FY 1999 Environmental Management Budget Request* showed that as of September 30, 1997, Oak Ridge stored 67 percent of the Department's mixed waste and 42 percent of the low-level waste.

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We acknowledge that the errors found were only representative of one-quarter of the year. However, during the exit conference, the management and integration contractor stated that it had not reviewed all waste inventory data or corrected all systemic errors identified during the audit. Therefore, the volume of waste shown in the inventory records continues to be overstated.

## Appendix

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### SCOPE

The audit was performed from March 27, 1998, to August 28, 1998, at the Oak Ridge Reservation in Oak Ridge, Tennessee and the Savannah River Site, near Aiken, South Carolina. The scope of our audit was limited to tests of inventory data used to track and report containers of hazardous, low-level, and mixed waste in April and May 1998.

The table below identifies the number of waste containers tracked as stored waste at the time of our audit and the number of containers randomly selected for audit review. Each of the three Oak Ridge facilities developed a unique waste inventory system while waste inventory systems at Savannah River were developed based on waste types.

<u>Entity</u>	<u>Containers in Inventory</u>	<u>Sample Size</u>
<b>Oak Ridge</b>		
ETTP	90,138	114
Y-12	11,900	113
ORNL	<u>2,982</u>	<u>110</u>
	105,020	337
<b>Savannah River</b>		
Low-Level Waste	11,219	113 <sup>3</sup>
Hazardous/Mixed Waste	1,892	108
Hazardous Waste	441	91
PCB Waste	<u>26</u>	<u>26</u>
	13,578	338
Total	<u>118,598</u>	<u>675</u>

### METHODOLOGY

To accomplish the audit objective, we:

- Reviewed waste inventory tracking and reporting procedures at Oak Ridge and Savannah River;

<sup>3</sup>The location and size of 110 containers could not be determined.

- 
- Identified automated systems used for tracking and reporting containers of hazardous, low-level, and mixed waste;
  - Selected random samples of containers and tested the accuracy and completeness of data recorded for each container selected;
  - Evaluated adjustments made by Oak Ridge personnel to waste inventory data; and
  - Determined how waste inventory data was used by management.

The audit was performed in accordance with generally accepted Government auditing standards for performance audits and included tests of internal controls and compliance with laws and regulations to the extent necessary to satisfy the audit objective. Accordingly, we assessed significant internal controls related to waste inventory data at Oak Ridge and Savannah River. Because our review was limited, it would not necessarily have disclosed all internal control deficiencies that may have existed at the time of our audit.

In completing the audit, we tested the accuracy and reliability of computer-processed waste inventory data at Oak Ridge and Savannah River. As discussed in the body of the report, we concluded that the data were not accurate or reliable.

We held an exit conference with Environmental Management, Oak Ridge, and Savannah River officials on November 19, 1998.

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